

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
8 January 2004 (08.01.2004)

PCT

(10) International Publication Number
WO 2004/003178 A3

(51) International Patent Classification⁷: **A61L 27/38**

(21) International Application Number:
PCT/JP2003/008248

(22) International Filing Date: 27 June 2003 (27.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2002-191527 28 June 2002 (28.06.2002) JP

(71) Applicants (*for all designated States except US*):
CARDIO, INC. [JP/JP]; 4-15-5-302, Temma, Kita-ku,
Osaka-shi, Osaka 530-0043 (JP). **NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY** [JP/JP]; 1-3-1, Kasumigaseki, Chiyoda-ku, Tokyo 100-8921 (JP).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **SAWA, Yoshiki** [JP/JP]; c/o Division of Cardiovascular Surgery Department of Surgery (E1), Osaka University Graduate School of Medicine, 2-2, Yamadaoka, Suita-shi, Osaka 565-0871 (JP). **TAKETANI, Satoshi** [JP/JP]; c/o Cardio, Inc., 4-15-5-302, Temma, Kita-ku, Osaka-shi, Osaka 530-0043 (JP). **IWAI, Shigemitsu** [JP/JP]; c/o Division of Cardiovascular Surgery Department of Surgery (E1), Osaka University Graduate School of Medicine, 2-2, Yamadaoka, Suita-shi, Osaka 565-0871 (JP). **MATSUDA, Hikaru** [JP/JP]; c/o Division of Cardiovascular Surgery Department of Surgery (E1), Osaka University Graduate School of Medicine, 2-2, Yamadaoka, Suita-shi, Osaka 565-0871 (JP). **HARA, Masayuki** [JP/JP]; c/o Tissue Engineering Research Center, NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY, 3-11-46, Nakoji, Amagasaki-shi,

Hyogo 661-0974 (JP). **UCHIMURA, Elichiro** [JP/JP]; c/o Tissue Engineering Research Center, NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY, 3-11-46, Nakoji, Amagasaki-shi, Hyogo 661-0974 (JP). **MIYAKE, Jun** [JP/JP]; c/o Tissue Engineering Research Center, NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY, 3-11-46, Nakoji, Amagasaki-shi, Hyogo 661-0974 (JP).

(74) Agents: **YAMAMOTO, Shusaku** et al.; Fifteenth Floor, Crystal Tower, 2-27, Shiromi 1-chome, Chuo-ku, Osaka-shi, Osaka 540-6015 (JP).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(88) Date of publication of the international search report:
22 April 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **DECELLULARIZED TISSUE**

(57) **Abstract:** An objective of the present invention is to overcome a problem that there is an inverse relationship between the decellularization rate and the strength of tissue. This problem was solved by immersing tissue in a solution containing a non-micellar amphipathic molecule (e.g., a 1,2-epoxide polymer). Thus, the present invention provides decellularized tissue, in which the cell survival rate of the tissue is less than a level at which calcification or an immune reaction is elicited in an organism and the tissue damage rate of the tissue is suppressed to a level which permits clinical applications. Tissue prepared by the above-described treatment preferably retains a certain level of tissue strength. Further, the tissue of the present invention has an effect of performing cell replacement.



WO 2004/003178 A3